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ALEXANDR ALEXANDROVICH KOTEREV(54) COILER FOR CONTINUOUS REELING OF WIRE
AND LIKE FLEXIBLE MATERIAL

(71) We, VSESOJUZNY NAUCHNO-
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STROENIA, of Ryazansky prospekt, 8a,
Moscow, Union of Soviet Socialist Republics,
a Corporation organised and existing under
the laws of the Soviet Socialist Republics, do
hereby declare the invention, for which we
pray that a patent may be granted to us,
and the method by which it is to be per-
formed, to be particularly described in and
by the following statement:—

The present invention relates to coilers for
continuous reeling of wire and like flexible
material, referred to hereinafter simply as
wire.

Extensive industrial use of both rolling mills
and drawing machines producing wire and
other flexible rolled products by the applica-
tion of a non-stop hot and/or cold process
has generated a need for developing winding
devices (reels) capable of winding the fore-
going products in coils by wapping the wire
on bobbins in layers without stopping or
delaying the rolling or wire-drawing pro-
cess when passing from a full bobbin to a
new one, and when threading the wire front
end on the bobbins at full speed of wire
feed.

Known in the prior art is a coiler for
continuous reeling of wire on bobbins which
are replaced without stopping the winding
operation comprising a reel turnplate carry-
ing two bobbins onto which the wire is
wound alternately. Reel spindles are disposed
vertically and spaced each at the same dis-
tance from the pivotal axis of the turnplate.
The bobbins are furnished with individual
drives, and in front of the turnplate is a
wire traversing device of the cam type.

Each bobbin is fitted with wire take-in
means, whose purpose is to receive a front
end of the wire in re-stringing, and with a
mechanism for severing and gripping the end
of the cut wire on an empty bobbin.

The latter mechanism comprises a lever

mounted on a non-detachable part of the
bobbin and equipped with a knife(s) clamp
which serves for cutting off the wire wound
on a wapping-off bobbin and clamping its
end to be wound on an empty bobbin by per-
forming oscillatory motion when the bobbin
is rotating about its axis.

For taking-in the front end of the wire
during re-stringing it is known to fit the
bobbin with pins capable of being lifted in
threading-up (see British Patent Specification
No. 1,152,698). In threading-up, the pins
cause the wire to pass round the bobbin.
Lying loosely in a space between the bobbin
body and the pins, the wire makes a wap
(a turn) producing tension. Since the first
waps are laid at random, the first coil is
irregular in shape. To avoid rejects, the
turnplate is revolved as soon as the tension
has appeared and an empty bobbin is handled
to be wound, whereas the wire wound on the
first bobbin is discarded.

To carry out this operation requires the
bobbins to be empty to the moment of re-
stringing, i.e. when the front end of the wire
is threaded-up, which may not be feasible
under all conditions and may cause delay.

The present invention is aimed at develop-
ing a coiler for continuous reeling of wire
and like flexible rolled products, in which
an appliance for taking-in the wire front
end would allow the production of coils of
proper shape substantially immediately after
re-stringing, i.e. on the first bobbin being
wound, providing as well high production
rate of the reel by reducing idle time during
accidental breaks of wire which are liable
to occur in winding low-quality wire.

The invention provides a coiler for con-
tinuous reeling of wire and like flexible
material, comprising a pair of spaced power-
operated bobbins mounted on a turnplate,
clamping means mounted on each bobbin for
clamping the wire onto the bobbin, and cut-
ting means also mounted on each bobbin
for cutting the wire adjacent the clamping
means, the turnplate being adapted to carry

the bobbins from a first position wherein a first bobbin is wound to a second position wherein the cutting means and the clamping means of the second bobbin are brought into engagement with the wire; the turnplate having take-in means in the form of a trough for guiding a wire end, when restringing the wire onto the bobbins, through the space between the bobbins towards tensioning means for tensioning the wire end, and guide roller means associated with each bobbin for guiding the wire around its associated bobbin when restringing the wire onto the other bobbin.

In the proposed coiler the tensioning means may comprise a pair of carryover pinch rolls positioned near the turn-plate in the direction of movement of the wire and capable of rotating from individual drives with a speed slightly in excess of that of the wire.

Due to the design of the take-in means, the front end of the wire is passed into the carryover pinch rolls, tensioned and, when the turnplate is revolved, makes a turn round the guide rolls of one of the bobbins and partially round the exterior of the first rotating bobbin to be wound. During this operation the wire, passing under the knife of the mechanism for severing and gripping the end of the cut wire on the empty bobbin, is slit, fastened and wound on the bobbin, running true in uniform rows to produce a properly shaped coil.

Thus, since a high-quality winding is obtained on re-stringing after accidental wire breakage by making use of only one of the bobbins, standstills due to accidental wire breakages are appreciably reduced.

The invention will now be described by way of an example with reference to the accompanying drawings in which:—

Figure 1 is a longitudinal cross-sectional view of a wire coiler.

Figure 2 is, a top plan view of the coiler positioned to pass a front wire end to a wire take-in means.

Figure 3 is a plan view of the coiler showing its position in cutting off and gripping the front end of the wire on one of the bobbins.

Figure 4 is cross-sectional elevation through the mechanism for severing and gripping the end of the cut wire onto a bobbin.

The reel, as shown in the drawings, comprises a turnplate 1 actuated by a drive 2 and carrying bobbins 4 attached on vertical spindles 3 operated by drives 5.

Mounted separately from turnplate 1 on one side are traversing devices with carriage 6 which is made up of horizontal and vertical rollers 7 free to perform up and down reciprocating motion parallel to the bobbin axes, and on the other side in the direction

of the wire movement-carryover pinch rolls 8 fitted with an individual drive providing a speed slightly in excess of that of the wire; a guiding device 9 for feeding wire into rolls 8; cutting means 10 and a scrap box 11 for wire cuttings.

On turnplate 1 are mounted the elements of a wire take-in means, in the form of a trough 12 disposed between bobbins 4 and a number of guide rolls 13 disposed around the bobbins on the wire exit side of trough 12 on both sides of the trough with axes parallel to the pivotal axes of bobbins 4.

Located on non-detachable elements of bobbins 4 are mechanisms 14 (Figures 2 and 3) for severing and gripping the end of the cut wire on the empty bobbin.

Means 14 incorporates a lever 15 (Figure 4) hinged on the non-detachable part of the bobbin and fitted with a top mobile knife-clamp 16 on one arm, a pawl 17 with a shaped projection 18 and a tooth 19 by means of which it engages the tooth of a trip 20. The trip carries a block 21, and pawl 17 interacts with a spring 22 mounted on a rod 23 which serves for locking bobbin 4 on spindle 3 with the aid of a nut 24. Trip 20 is connected to another arm of lever 15 through a spring 25. Secured on the same arm of lever 15 is a pin 26.

The non-detachable member of the bobbin also has attached to it a bottom knife 27. The same arm of lever 15 is furnished with a roller 28 through which it rests on the working surface of a ring-shape guide block 29 arranged stationary under the bobbin and intended to impart oscillatory up and downward motion during one revolution of the bobbin to knife-clamp 16.

The coiler operates as follows:

In threading-up the front end of the wire turnplate 1 (Figures 1 to 3) is placed in position shown in Figure 2. Upon leaving a rolling mill, wire 30 passes between rollers 7 of carriage 6 of the traversing device and via trough 12 is admitted between carryover pinch rolls 8 ensuring wire tension.

Then turnplate 1 revolves along arrow A in such a manner that the wire passes round guide rolls 13 of one of bobbins 4 and a part of the exterior of the other bobbin to be wound.

Meanwhile carriage 6 of the spreading device starts moving downwards advancing the wire under top knife-clamp 16 (Figure 4) which on moving downwardly subdivides the wire, interacting with bottom knife 27, and clamps simultaneously the front end of the cut-off wire with knife 16 pressing through the wire on block 21 which deflects trip 20 downwards. The tooth of trip 20 disengages tooth 19 of pawl 17 and under the action of spring 22 the pawl rocks about its pivot such that its shaped projection 18 grips pin 26 of lever 15 thereby clamping

the front end of the wire between knife 16 and block 21.

Then, the winding operation proceeds uniformly and turnplate 1 swings through a desired angle suitable for proper winding. On wapping off one bobbin, turnplate 1 rotates so that the wire, being wound on that bobbin, will make a part of a turn round the exterior of another bobbin which is the next to be wound. Passing under the knives of the mechanism 14 of that bobbin the wire is split, and its end is clamped and fastened on the empty bobbin to which winding is now transferred.

A piece of wire gripped by carryover pinch rolls 8 during re-stringing and going to discard is passed to cutting means 10 where it is cut into pieces and dropped into scrap box 11.

As it is seen from the foregoing description, the reel proposed herewith permits producing a regularly shaped wire coil directly after threading-up the front end. In addition, if the wire is broken its front end can be re-stringed and a high-quality coil obtained thereupon by using only a single empty bobbin.

WHAT WE CLAIM IS:—

1. A coiler for continuous reeling of wire and like flexible material, comprising a pair of spaced power-operated bobbins mounted on a turnplate, clamping means mounted on each bobbin for clamping the wire onto the bobbin, and cutting means also mounted on

each bobbin for cutting the wire adjacent the clamping means, the turnplate being adapted to carry the bobbins from a first position wherein a first bobbin is wound to a second position wherein the cutting means and the clamping means of the second bobbin are brought into engagement with the wire; the turnplate having take-in means in the form of a trough for guiding a wire end, when restringing the wire onto the bobbins, through the space between the bobbins towards tensioning means for tensioning the wire end and guide roller means associated with each bobbin for guiding the wire around its associated bobbin when restringing the wire onto the other bobbin.

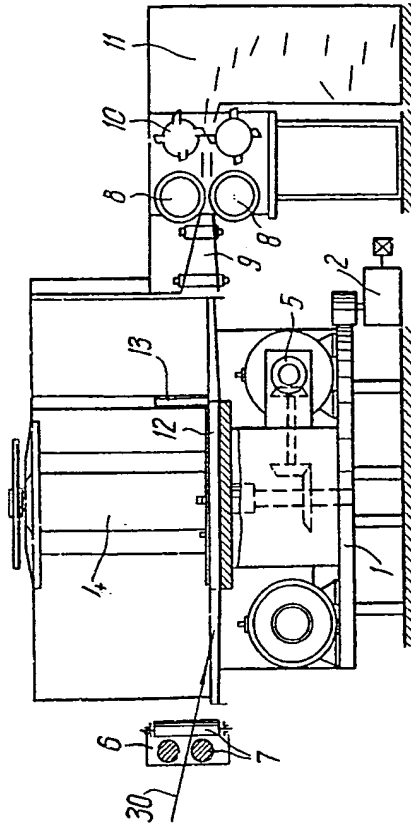
2. A coiler, as claimed in Claim 1, in which the device for tensioning the wire, comprises a pair of carryover pinch rolls adjacent the turnplate arranged to be driven at a speed slightly exceeding that of the moving wire.

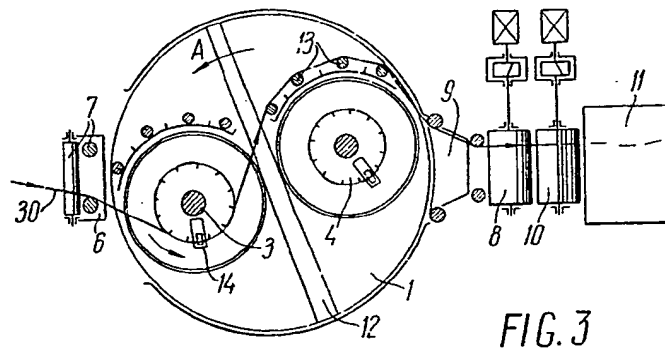
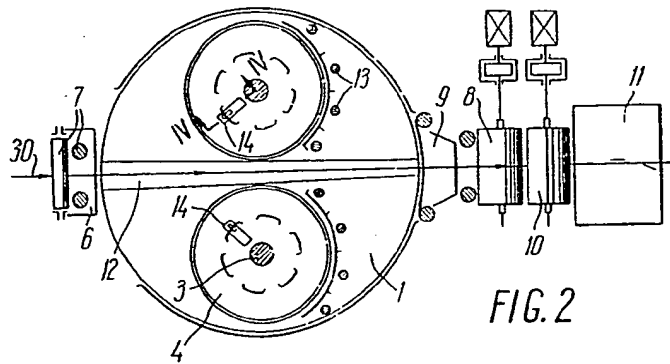
3. A coiler as claimed in any one of the preceding claims in which at least one pair of guide rollers is mounted at the wire outlet end of the trough, the guide rollers of the or each pair being located on opposite sides of the trough and the axes of rotation of the rollers of each pair being parallel to the axes of rotation of the bobbins.

4. A coiler, substantially as herein described with reference to the accompanying drawings.

MARKS & CLERK.

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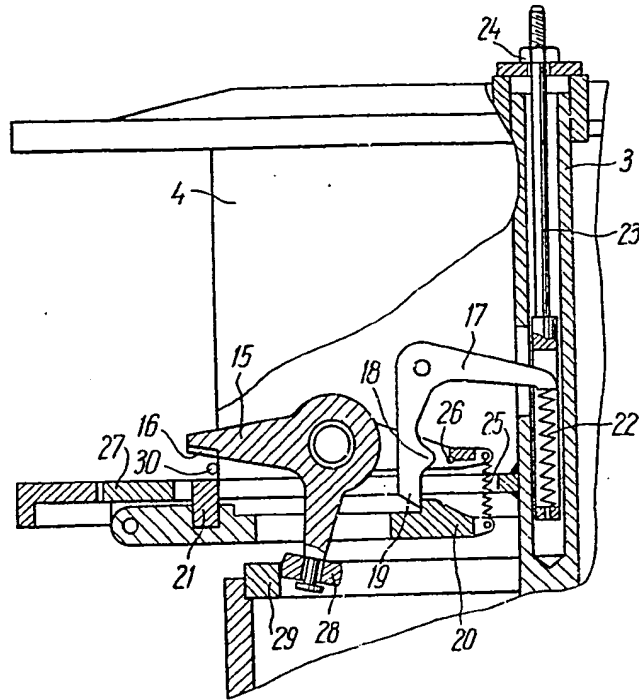


FIG. 4

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